AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (original) A transmitter apparatus comprising one or more lasers, modulation means to intensity modulate radiation output by each of said one or more lasers, and output means for outputting the modulated radiation produced by the modulation means characterised in that the apparatus comprises hollow core optical waveguides formed in a substrate which, in use, guide radiation from the one or more lasers to the modulation means and from the modulation means to the output means.

2. (previously presented) An apparatus according to claim 1 wherein at least one of the one or more lasers and the modulation means is a discrete component.

3. (original) An apparatus according to claim 2 wherein said discrete component is located in an alignment slot formed in the substrate.

4. (previously presented) An apparatus according to claim 1 wherein at least one of the one or more lasers and the modulation means is a monolithic component formed in the substrate.

5. (previously presented) An apparatus according to claim 1 wherein the output means is arranged to couple the modulated radiation into at least one output optical fibre.

6. (original) An apparatus according to claim 5 wherein the output means comprises at least one fibre attachment means.

7. (original) An apparatus according to claim 6 wherein at least one optical fibre attachment means is arranged to receive a lensed output optical fibre.

8. (original) An apparatus according to claims 6 wherein at least one optical fibre attachment means comprises a mode matching means.

9. (previously presented) An apparatus according to claim 1 comprising one laser.

10. (previously presented) An apparatus according to claim 1 and comprising a plurality of lasers.

11. (original) An apparatus according to claim 10 wherein each of said plurality of lasers have a different output wavelength.

12. (original) An apparatus according to claim 11 wherein beam combining means are additionally provided to combine the plurality of modulated beams into a combined beam wherein said output means is arranged to couple the combined beam into a single output optical fibre.

13. (previously presented) An apparatus according to claim 10 wherein said output means is arranged to couple each of said plurality of modulated beams into one of a plurality of output optical fibres.

14. (previously presented) An apparatus according to claim 1 wherein one of said one or more lasers is a semiconductor laser.

15. (original) An apparatus according to claim 14 wherein said semiconductor laser is a wavelength tuneable semiconductor laser.

16. (previously presented) An apparatus according to claim 1 wherein one or more detectors are provided to monitor the intensity of radiation output by said one or more lasers.

17. (previously presented) An apparatus according to claim 1 and further comprising at least one optical isolator.

18. (previously presented) An apparatus according to claim 1 wherein one or more beam shaping means are provided.

19. (original) An apparatus according to claim 18 wherein at least one of said beam shaping means comprise one or more lenses.

20. (previously presented) An apparatus according to claim 18 wherein at least one of said beam shaping means comprises a tapered hollow core optical waveguide.

21. (previously presented) An apparatus according to claim 1 wherein said modulation means comprises one or more electro-optic modulators.

22. (original) A transmitter apparatus comprising at least one laser capable of producing intensity modulated radiation and output means for coupling the radiation produced by the laser into at least one output optical fibre characterised in that the apparatus comprises hollow core optical waveguides formed in a substrate which, in use, guide radiation from the at least one laser to the at least one optical fibre.

23. (currently amended) A receiver apparatus comprising one or more detectors and one or more optical fibre attachment means, the one or more optical fibre attachment means being arranged to receive one or more one optical fibres, ~~characterised in that~~wherein radiation is guided from the one or more optical fibres to the one or more detectors by at least one hollow core optical waveguide formed in a substrate, said hollow core waveguide guiding said radiation in two transverse directions.

24. (original) An apparatus according to claim 23 comprising a plurality of detectors.

25. (original) An apparatus according to claim 24 wherein a plurality of optical fibre attachment means are provided to receive a plurality of optical fibres.

26. (original) An apparatus according to claim 25 wherein, in use, radiation from each of said plurality of optical fibres is guided to one of the plurality of detectors.

27. (original) An apparatus according to claims 24 wherein one optical fibre attachment means is provided, said optical fibre attachment means being arranged to receive one optical fibre carrying radiation comprising a plurality of different wavelength channels.

28. (original) An apparatus according to claim 27 and further comprising wavelength demultiplexing means, said wavelength demultiplexing means being arranged to separate said different wavelength channels and to direct each wavelength channel to one of the plurality of detectors.

29. (previously presented) An apparatus according to claim 23 and further comprising at least one variable optical attenuator arranged to provide controllable attenuation of the radiation received from said at least one optical fibre.

30. (previously presented) An apparatus according to claim 23 and further comprising at least one wavelength selective filter.

31. (previously presented) An apparatus according to claim 23 wherein at least one optical fibre attachment means comprises a mode matching means.

32. (previously presented) An apparatus according to claim 23 wherein at least one optical fibre attachment means is arranged to receive a lensed optical fibre.

33. (previously presented) An transmit/receive apparatus comprising transmitter apparatus as claimed in claim 1 and receiver apparatus.

34. (original) Apparatus according to claim 33 wherein said transmitter apparatus and said receiver apparatus are formed on a common substrate.

35. (previously presented) An apparatus according to claim 1 wherein the substrate comprises semiconductor material.

36. (original) An apparatus according to claim 35 wherein the substrate comprises a silicon on insulator (SOI) wafer.

37. (previously presented) An apparatus according to claim 1 formed by micro-fabrication techniques.

38. (original) An apparatus according to claim 37 wherein the micro-fabrication technique includes deep reactive ion etching.

39. (previously presented) An apparatus according to claim 1 wherein the hollow core optical waveguides are of substantially rectangular cross section.

40. (previously presented) An apparatus according to claim 1 wherein the hollow core optical waveguides are dimensioned to preferably guide radiation propagating in the fundamental mode.

41. (previously presented) An apparatus according to claim 1 wherein the hollow core optical waveguides are dimensioned to preferably guide radiation propagating in multiple optical modes.

42. (previously presented) An apparatus according to claim 1 wherein the internal surfaces of the hollow core optical waveguides carry a reflective coating.

43. (previously presented) An apparatus according to claim 1 wherein the substrate comprises a base portion and a lid portion.

Claims 44-46. (Cancelled)

AMENDMENT OF INVENTIVE ENTITY

This response is not only responsive to the outstanding Official Action, but is an amendment of the inventorship pursuant to the provisions of Rule 1.48, in that James McQuillan was named as a co-inventor when in fact he was not an actual co-inventor of the present invention. The error in the listing of co-inventors was discovered when investigating the cited Jenkins references.

Therefore, and in accordance with 37 CFR 1.48(a), Applicants respectfully request that the inventorship be amended to reflect only co-inventors McNie and Jenkins and not include the previously noted co-inventor McQuillan. This request complies with Rule 48(a)(1).

Applicants include herewith a Declaration from James McQuillan, a person being deleted as an inventor, describing the facts and circumstances leading up to his being erroneously included as a co-inventor in this application. It is noted that paragraph 8 of the McQuillan Declaration establishes that the error in naming him as a co-inventor occurred "without deception intention" on his part. Paragraph 8 of the McQuillan Declaration is believed to comply with Rule 48(a)(2).

Applicants also enclose herewith a signed and dated substitute Declaration by the remaining co-inventors. The signed and dated substitute Declaration comprises compliance with Rule 48(a)(3).

Applicants' cover sheet confirms payment of the inventorship correction processing fee. This fee complies with Rule 48(a)(4).

Attached hereto is a written Consent of the Assignee, QinetiQ Limited, in the correction of inventorship as noted above. This written Consent complies with Rule 48(a)(5).

In accordance with the provisions of Rule 48(a) and having complied with each of the five subsection requirements, it is respectfully requested that James McQuillan be deleted as a co-inventor of the above-identified application and that the corrected Patent Office records reflect such deletion.